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THE CAPITAL AND LABOUR REQUIREMENTS OF PAKISTAN'S FOREIGN TRADE, BASED ON THE INPUT-OUTPUT STRUCTURES OF 1962-63, 1969-70 AND 1974-75.

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THE CAPITAL AND LABOUR REQUIREMENTS OF PAKISTAN'S FOREIGN TRADE, BASED ON THE INPUT-OUTPUT STRUCTURES OF 1962-63, 1969-70 AND 1974-75.

I. INTRODUCTION

The importance of international trade for economic development and growth has been studied and researched a lot. Some economists like Ragnar Nurkse (17) and Gottfried Haberler (4) have shown trade to be an 'engine of economic growth'. Specialization helps better resource allocation and promotes growth. In labour-abundant economies, international trade can accelerate development by a process of reallocation of labour from an over-populated subsistence agricultural sector to a growing industrial sector. International trade and its changing levels introduce changes in income distribution within the concerned economies.

Despite the recent migration of Pakistan's labour to the Middle East countries, Pakistan is still characterized as a labour-abundant and capital-scarce developing country. Given such a nature of Pakistan's economy, it is important that Pakistan's production structure should be such as to employ greater labour and lesser capital per unit of output in different sectors of the economy. To provide pertinent information to the policy makers in this regard, we here try to estimate how much of both the Factors of Production i.e., Labour as well as Capital are employed and absorbed per unit of output in Pakistan's internationally traded goods.

The proponents of Export Promotion (E.P.) Trade Strategy have recently argued that the developing countries should be exporting goods which employ more of their abundant factor of production i.e., labour. They claim that the E.P. Strategy will not only make an efficient use of resources but would also lead to an equitable income distribution. Adoption of the E.P. Strategy would lead to an improvement in income distribution in the poor countries through capital loss and labour gain. The basic reasoning advanced by the exponents of export promotion is that this strategy leads to greater labour absorption and, through it, to a larger total wage bill and lesser capital employment. The share of profits in the GNP thus gets reduced.

Heckscher-Ohlin's Factor Endowment Trade Theory (5, 18) also provides similar insights and policy guide-lines. According to this theory, a country exports commodities which employ the abundant factor of production intensively and imports the commodities which utilize the scarce factor intensively. The first empirical test of Heckscher-Ohlin's Theorem was not very encouraging, and had led to a new phrase of Leontief's Paradox (3). Further empirical evidence on this issue by Bela Balassa (1), Bharadwaj (2), Tatemoto and Ichimura (25) and Wahl (26), however, showed that the Factor Endowment Trade Theory was good enough to explain the basic causational flow of international trade.

Various aspects of Pakistan's foreign trade have been studied extensively (24, pp.15-16). However, so far no particular

attempt has been made to estimate the capital and labour requirements of Pakistan's foreign trade. Which, in fact, determine the structural basis of a country's international trade. This study addresses itself to this particular problem. In this research report, after estimating the factors' requirements per million rupees worth of exports and imports, an attempt is made to see whether Pakistan's exports have been labour-intensive and, so, consistent with the natural, national resource base. Thus, this study also enables us to test whether the pattern of Pakistan's foreign trade, with its empirical evidence, further supports Heckscher-Ohlin's Factor Endowment Trade Theory, or whether it shows any kind of Leontief's Paradox. Mainly because of such special aspects, I think, this piece of work comes as one of the first ones along these lines in Pakistan.

This research paper has been classified into five major sections. The second section outlines the method of analysis. The third section discusses data requirements. The fourth section presents empirical results and dwells briefly on some obvious policy implications. The final section sums up main conclusions and major policy recommendations of the study.

II. METHODOLOGY

The following methodological framework has been adopted for the evaluation of factor requirements. The methodology does not differ in any special sense from that of Leontief (14, pp.126-128), and is illustrated here for the convenience of the readers. It starts from the basic balance equation of an economy as follows:

$$X = AX + E - M + F \quad \text{----------(1)}$$

Where $X = \{X_1, X_2 - - - - - - - - - X_n\}$ is a column of output values of the n sectors of the economy, n = 1, 2, -------33; i.e., X is gross domestic product.

$A = \left[a_{ij} \right]_{n,n}$ is a square matrix of input-output coefficients; and a_{ij} is the amount of sector i's product used by sector j. So 'AX' becomes the intermediate demand for total output.

$F = \{F_1, F_2 \text{ ------} F_n\}$ is a column of residual constants. Each F_i represents that part of sector i's output which is allocated directly to all final uses such as consumption and investment, i.e. other than exports.

E and M are, respectively, the values of total exports from and imports into 'n' sectors in millions of rupees. The total exports and imports can be expressed into their proportional distribution over 'n' sectors of the economy as below:

$$E = \begin{bmatrix} e_1 \\ e_2 \\ \vdots \\ e_i \\ \vdots \\ e_n \end{bmatrix} * \bar{E} \quad \text{and} \quad M = \begin{bmatrix} m_1 \\ m_2 \\ \vdots \\ m_i \\ \vdots \\ m_n \end{bmatrix} * \bar{M} \qquad \text{----------(2)}$$

Where, each $e_i = \frac{E_i}{\bar{E}}$ and $m_i = \frac{M_i}{\bar{M}}$ shows, respectively, the amount of sector i's exports and imports per unit value (million rupees) of total exports from, and imports into 'n' sectors. Substitution of (2) into (1), and the transposition of 'AX' to the left hand side yields the following:

$$\begin{bmatrix} X - AX \end{bmatrix} = \begin{bmatrix} (e_i) \cdot \bar{E} - (m_i) \cdot \bar{M} + F_i \end{bmatrix} \qquad \text{----------(3)}$$

$$\begin{bmatrix} X \end{bmatrix} = \begin{bmatrix} I - A \end{bmatrix}^{-1} \cdot \begin{bmatrix} (e_i) \cdot \bar{E} - (m_i) \cdot \bar{M} + F_i \end{bmatrix}$$

$$\begin{bmatrix} X_e \end{bmatrix} = \begin{bmatrix} I - A \end{bmatrix}^{-1} \cdot \begin{bmatrix} e_i \end{bmatrix} \qquad \text{----------(4)}$$

$$\begin{bmatrix} X_m \end{bmatrix} = \begin{bmatrix} I - A \end{bmatrix}^{-1} \cdot \begin{bmatrix} m_i \end{bmatrix} \qquad \text{----------(5)}$$

X_e and X_m in equations (4) and (5) indicate the respective amounts of gross domestic product needed to sustain a unit (million rupees worth) of exports and imports replacements.

Premultiplying sectoral (direct) capital and labour coefficient row vectors, i.e.,

$$\begin{bmatrix} k_i \end{bmatrix} = \begin{bmatrix} k_1, & k_2, & \text{---------} & k_n \end{bmatrix} \quad \text{----------(6)}$$

$$\begin{bmatrix} l_i \end{bmatrix} = \begin{bmatrix} l_1, & l_2, & \text{---------} & l_n \end{bmatrix} \quad \text{---------(7)}$$

Where each k_i and l_i shows the respective amount of capital and labour needed to produce one unit of output in ith sector — to $\left[I - A \right]^{-1}$; we get total (direct and indirect) sectoral capital and labour requirements per unit value of output.

The premultiplication of sectoral (direct) capital and labour coefficient row vectors (6) and (7) to equations (4) and (5), gives capital and labour requirements per million rupees worth of exports and import replacements, respectively. The resulted factor requirements help calculating capital-labour ratios for exports and imports, whose comparison is made to verify some of the desired hypotheses.

III. DATA

Indeed, this multivariate statistical study has been prepared as a sort of comparative static analysis of Pakistan's[1/] factor requirements over 1962-63, 1969-70 and 1974-75. Conducting this type of quantitative analysis required plenty of data in the form of full vectors on capital and labour-output ratios, the sectors' proportional share of total exports and imports, and the matrices of input-output coefficients along with their inverses for each of the above respective years. All required data, obtained through various sources can be briefly explained as follows.

The capital coefficients for the manufacturing sector for 1962-63 have been taken from Khan and MacEwan (11, pp.454, 457). For non-manufacturing sector Khan and MacEwan's capital coefficients (11, p.460) have been used for 1962-63 as well as for 1969-70. Capital coefficients for the manufacturing sector for 1969-70 have been taken from Kemal (9, p.355). Kemal's certain aggregate capital-output ratios were, of course, decomposed by using the output shares of the respective industries as weights for 1969-70. The coefficients for other food and drink, wood cork and furniture, coal and petroleum products were obtained by dividing their replacement costs by their level of output in 1969-70 (19).

1/ Pakistan stands here for the region known as West Pakistan before the 1971's disintegration of East Pakistan.

According to Khan's method (12, pp.65-70) the replacement cost was calculated by multiplying Khan's average correction factors (11, p.483) to the assets book value of these industries given in (19). For construction the multiplication of Khan's capital-labour ratio (12, p.83) to the labour-output ratio yielded the required capital-output ratio.

Labour coefficients—expressed as man-years required per million rupees of output—for the manufacturing sector for 1962-63 as well as for 1969-70 have been obtained from the labour and output data of (19). Output weights were used for decomposing certain aggregate figures of labour and output. Labour coefficients for the non-manufacturing sector for 1962-63 and 1969-70 are based on the labour estimates found by applying their given employment proportions (20, pp.4, 27, 29) to the total level of employment in the respective years and the output estimates obtained by applying West Pakistan's proportion of gross national product (15, pp.38-39) to Pakistan's sectoral gross national product estimates given in (20, pp.296-297). The proportion of agricultural crops' output to the total agricultural output (21) are used to obtain the labour-output estimates of agricultural crops. The coefficients for 1974-75 could not be obtained because most of the data pertaining to manufacturing sector is to be extracted from the census of manufacturing industries, which until the earlier completion of this study was not published for any year later to 1970-71. So the capital and labour coefficients

of 1969-70 have been used for computing the capital and labour requirements for 1974-75.

All of the direct capital and labour input-output coefficients for 1962-63 and 1969-70 have been reported in appendix Table 5. Consistent with the definition given in the methodological section on page 6, we have presented in the same table the total[2/] (direct and indirect) capital and labour requirements for 1962-63, 1969-70 and 1974-75. We have also tried to conduct a sort of sensitivity analysis for these factor requirements. The series of capital and labour requirements have been ranked in descending order. A comparison of the respective sectoral ranks to the median rank— which is seventeen in each of the series — shows the relative capital and labour intensity of each sector. One further possible use of the given total factor requirements is that if we ever wish to see for a later time period the effect of changes in the composition of exports and imports over the capital and labour estimates of Table 1 of this study, then multiplying the given total capital and labour requirements as row vectors

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2/ In reference to the practical use of the figures for policy purposes I would like to point out that a comparison of average capital-labour ratios in Table 1 and the individual industry capital-labour ratios — obtainable from the given sectoral total (direct and indirect) capital and labour requirements in Table 5 — may help inter-industrial cost-benefit analysis. In other words if e.g., the capital-labour ratio of a projected export industry was lower than the average capital-labour ratio for the import competing industries, this could be one possible argument in favour of such a project. On the other hand, we might find that a projected import substitution industry had a higher capital-labour ratio than the average ratio for the existing export industries.

to the new column vectors of exports and imports' proportions, one gets the new factor requirements per million rupees worth of exports and imports replacements. The difference between the new and the factor requirements estimated by this study would be attributable to the changes in the composition of exports and imports over the concerned period.

For studying any of the structural change taking place over years between two series of a particular type of factor requirement, say capital, K^{*} and K^{**}; we have calculated the rank correlation coefficients. And for determining the direction and degree of relationship between two types of factor requirements viz., capital and labour, such as K^{*} and L^{*}, we have calculated simple correlation coefficients. Which indicate whether an increase (decrease) in one factor requirement also increases (decreases) the other factor requirement. Thus they also show whether the two factors of production i.e., capital and labour have been used as substitutes or compliments over different sectors of the economy. The rank and simple correlation coefficients are given in appendix Table 5.1. All the series are found to be positively correlated and t-statistics are significant at 90 to 99 percent confidence level. Which means that each of the particular type of factor requirements viz., capital and labour are found structurally not significantly different over the different years. The positive and significant correlation between capital

and labour imply that an increase (decrease) in one factor requirement also increases (decreases) the other factor requirement. Which alternatively implies that the installation and utilization of capital has been used more in a complimentary form rather than as a substitute to labour in Pakistan.

As defined on page 5, the sectoral export and import proportions have been worked out from the data gathered from Foreign Trade Statistics of Pakistan. The data for the consecutive years, consistent with our industrial classification, were compiled at the Institute.[3/] Now whenever needed, one can obtain the exports and imports of each sector over respective years by multiplying the sectoral export and import proportions to the corresponding total exports and imports of those years. Sectoral export and import proportions along with the total exports and imports over 1962-63 to 1974-75 have been reported in appendix Table 6.

In order to test about any kind of diversification and significant structural change in the composition and structure of Pakistan's exports and imports, we have computed Spearman's rank correlation coefficients for the export and import proportions over the years of 1962-63 to 1974-75 and 1969-70 to 1974-75. The rank correlation coefficients along with their t-statistics are given in appendix Table 6.1. All the rank correlation coefficients in their positive form, and with significant t-statistics at 99 percent confidence level reject the null hypothesis in favour of the alternative one.

3/ I may here rightly acknowledge that the data on exports and imports were compiled and classified by Ms. Surraiya Nishat and Ms. Seemin A. Khan— our research fellows of the P.I.D.E.

Implying that there has not been much of diversification or any significant structural change in the pattern of Pakistan's exports and imports over 1962-63 to 1974-75. Which alternatively also implies that Pakistan's exports structure in the 1970s has been almost as primary-product oriented as it used to be in the early 1960s.

As far as input-output tables are concerned, they are generally available with long lags, and seldom on year to year basis. Because of this reason, the input-output tables are mostly used in their various adjusted and updated forms. At the start of this research work, we had available original published input-output coefficient matrix of Khan and MacEwan (10, Appendix Table 5B) for 1962-63. We adjusted, inflated and updated the same input-output flow table (10, Appendix Table 4B) at 1969-70 and 1974-75 prices, respectively.

The adjustment has been made with the idea that in a price mechanized economy, the prices of final goods inherently reflect the variations in inter-industry input-demand structure taking place out of the changes in demand and supply (cost) factors. With the above idea, we have adjusted the 1962-63 input-output table by the following method illustrated through the language of mathematics as below.

$$F_{ij}^{t} = \frac{F_{ij}^{o}}{p_i^{o}} \cdot p_i^{t} = F_{ij}^{o} \cdot \frac{p_i^{t}}{p_i^{o}} \quad \text{.....(8)}$$

$$a_{ij}^{t} = \frac{F_{ij}^{t}}{X_{j}^{t}} \quad \ldots\ldots\ldots\ldots\ldots\ldots (9)$$

where,

F_{ij} = The flow of sector i's output being used as input in sector j; i, j = 1, 2, ...33;

o = Base year viz., 1962-63;

t = Current year viz., 1969-70, 1974-75;

p_i = The price index of sector i's output;

a_{ij} = The input-output coefficient, i.e. the amount of sector i's output needed to produce a unit value (million rupees) of output in sector j,

X_j = Gross value of output in sector j.

According to this method, we first convert the base year i.e., 1962-63 inter-industry input flow values into their quantity magnitudes through deflating the former by their corresponding prices of 1962-63. The quantity magnitudes are then valued and transformed as input flows at the current year price levels of 1969-70 and 1974-75. The resulting input flows of a given sector divided by the gross value of output of the recipient sector, yield the input-output coefficient for that particular sector. Such input-output coefficients across all the sectors form the input-output coefficient matrices for the respective current years. All the input-output coefficients for 1962-63, 1969-70 and 1974-75 have been reported in appendix Table 7. Gross value of output of each sector is also given in the same table for all the years against code number 100. Whenever desired, the input-output flow matrices for the respective years can also be

obtained from appendix Table 7 by multiplying the input-output coefficients of each industry to the gross value of output of that industry for each particular year.

The price indices used for adjusting base year's input-output industrial flows are given in appendix Table 5. Most of these are obtained from (20, pp.317-320; 22,pp.177-202). Whereas Paasche's weighted price indices based on gross national product estimates of current and constant factor costs (20, pp.296-300; 22, pp.144-146) have been calculated for certain industries viz., all other agriculture, forestry and fishry, construction, electricity and gas, transport, trade, government, and services n.e.s.

Industrial classification adopted in our adjusted input-output coefficient matrices is mainly that of Khan and MacEwan (10, pp.41-42) , except for the following few changes. A few industries of Khan and MacEwan's input-output table viz., jute growing and baling, tea growing and processing, jute textiles, and ownership of dwellings have not been included in our new tables, as they had little interdependence and entries of inputs from, and to the other industries. Three categories of construction, i.e. residential, non-residential and all other construction have been aggregated because of their high similarity, and the difficulty involved in obtaining their needed corresponding disaggregated data on price indices and capital, labour coefficients. Four industries of the original table have been disaggregated since they are important

and their relevant, necessary data are easily obtainable. The industries were paper and printing, other chemicals, machinery and transport equipment. Each of the four industries has been decomposed, respectively, into two sub-industries as paper and paper products, printing and publishing, industrial chemicals, non-industrial chemicals, electrical machinery, non-electrical machinery, motor vehicles and other transport equipment. The level of output of each disaggregated industry as a proportion to that of major industry has been used as disaggregating weight. The final industrial codes and classification are given in appendix Table

It may be pointed out that our inflated input-output coefficient matrices are based on an implicit assumption that the inter-industrial proportion of input flows remains constant over the period of study viz., 1962-63 to 1969-70, and 1974-75. The assumption[4/] is not so uncommon or unrealistic in the field of input-output analysis developed mainly on fixed coefficient production functions. The input flows as a proportion to the output almost remain constant over fairly good period. On account of the huge costs involved in the preparation of input-output tables, neither developed nor a developing nation can afford to have fresh, up-to-date tables on annual basis.[5/] Naturally, such data are used with certain adjustments

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4/ Though, some of us may still worry about any such assumption of fixed proportions etc. And, for some further relief of any such concerned persons, I may refer Milton Friedman's famous collection of *'Essays on Positive Economics'*. Where in his leading article *'On the Methodology of Positive Economics'*, he emphasizes the fact that for applied economics work it is not any of the assumptions which stand important, rather it is mainly the empirical results which stand much more important as they indicate the direction and degree of magnitude for various research problems through their quantitative estimates. However, as far as the effects of any possible technical change are concerned we have already tried to cover and capture them through the final price adjustments of the input-output tables over the three phases of our study.

5/ The P.I.D.E., at a later stage, initiated a project for preparing an original, survey-based Input-Output Table for Pakistan. Which has been recently published in April 1985 for the actual, observed input-output data base of 1975-76 (23).

over years. For instance, Leontief's second attempt of 1951 has been carried out on the data of internal structural relationships of 1947 (14, p.120). And Bharadwaj's study (2, pp. 107-108) is based on Indian and United States trade data of 1951 adjusted at the prices of 1953-54 and 1947, respectively. In this perspective our adjusted input-output coefficient matrices do not seem incompatiable with the general practice. Rather these matrices and their empirical application may provide a good basis for some comparison with any such similar study in future[6/] for Pakistan.

Anyway, the above discussed input-output coefficient matrices along with all other data processed through the given methodological framework enabled us to get computer results which are presented in the following section.

6/ It may be interesting to note as a topic of future research that as soon as some actual, observed Input-Output Table for Pakistan becomes available for the time-period of mid-Eighties, then a similar study could be taken up for 1985-86 and 1975-76 input-output tables, and their results could be compared with the results of this study to find out any of the structural changes in Pakistan's Economy. It has been remarked by Dr. Sohail J. Malik, Research Economist, P.I.D.E., that the results of this type of research studies could be sensitive with respect to the level of aggregation of their basic input-output tables. So, some sort of sensitivity analysis could also be tried through some corresponding study to test any such proposition. Which has also been somewhat earlier tried in Nishat's paper (16), and her another paper of *Pakistan Development Review*, Vol.XVII, No.1. Spring 1978. PP. 28-43.

IV. RESULTS AND POLICY IMPLICATIONS

For the objective of finding out the estimates of Factors' Requirements for Pakistan's Foreign Trade, we first estimate the capital and labour employed per unit of one million rupees worth of Pakistan's Exports and Imports Replacements.[7/] Table 1 presents these estimates for 1962-63, 1969-70 and 1974-75. A comparative static analysis of the quantitative estimates shows that in the early years of Pakistan's industrialization, it needed greater capital and labour than in later years to produce a million rupees worth of output in export-producing as well as in import-substituting industries. According to the computer results, during 1962-63, the production of a million rupees worth of exports required a capital of about Rs. 2.6 million and employed 992 labour man-years. The 1962-63 capital-labour ratio of exports shows that it took about 2.6 thousand rupees' capital for the employment generation of each man-year in the export industries. In the same year, the production of a million rupees worth of import replacements required a capital of about 1.8 million

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7/ It may be noticed that all of our imports might not be perfectly competitive ones. However, the use of domestic input-output structure and capital, labour coefficients here sounds logically reasonable as the basic objective is to estimate the factors' (capital and labour) requirements per million rupees worth of import replacements as if they were produced domestically.

Table 1

The Capital and Labour Requirements per Million Rupees of Pakistan's Exports and import Replacements for 1962-63, 1969-70 and 1974-75.

	1962 - 63			1969 - 70			1974 - 75		
	K	L	$k^*=\frac{K}{L}$	K	L	$k^*=\frac{K}{L}$	K	L	$k^*=\frac{K}{L}$
Exports = E	2,575,852.0	991.84	2,597.04	1,373,483.0	345.11	3,979.84	1,578,957.0	415.85	3,796.94
Imports = M	1,814,208.0	447.87	4,050.75	1,195,975.0	262.35	4,558.70	1,860,678.0	362.2	5,137.16
R_1^*	1.42	2.215		1.148	1.315		0.849	1.148	
R_2^*	0.704	0.452		0.871	0.76		1.178	0.871	
$Z = \frac{R_1^{*L}}{R_1^{*K}}$		1.56			1.15			1.35	

Notes:

K = Capital in Rupees at respective year's prices.

L = Labour Man-Years.

R_1^* = Ratio of capital (labour) required for one unit of exports to the capital (labour) required for one unit of imports. For instance, $R_1^{*K} = \frac{K_E}{K_M}$.

$R_2^* = \frac{1}{R_1^*}$ = Ratio of capital (labour) required for one unit of imports to the capital (labour) required for unit of exports, e.g. $R_2^{*K} = \frac{K_M}{K_E}$.

rupees and employed 448 man-years of labour in the import-substituting industries. The corresponding capital-labour ratio of imports indicates that it cost about four thousand rupees' capital for the employment creation of each man-year in the import-substituting industries. The capital-labour ratio of exports and that of imports rightly bring in the point of comparative cost and comparative advantage here. The smaller capital-labour ratio of exports than that of imports truly reflects a smaller comparative cost (and, hence, greater comparative advantage) in the production of export goods industries in Pakistan, than in the import-substituting industries. That is why, that during 1962-63 the entrepreneurs and capitalists in Pakistan went for greater capital formation and investment in the export industries. It also employed much greater labour first in the installation and then in the utilization of that huge capital[8/] in export goods industries.

To avoid any further details, the interested reader may well interpret the quantitative estimates of 1969-70 and 1974-75 along the above discussion of the estimates of 1962-63. However, it is noticeable that some better and efficient use of resources was made by 1969-70; for by that year both capital and labour requirements per unit went down for exports as well

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8/ The absolute requirements of both capital and labour per unit of exports exceeding the corresponding requirements of the factors per unit of imports for 1962-63 and 1969-70 may also reflect the gross inefficiency in the production of exports. Which may have resulted because of the excessive protection and subsidies provided to the consumer goods export oriented industries as compared to the least protected intermediate and capital goods industries whose output is not meant for exports.

as for imports. Though, later on, by 1974-75, the factor requirements went up slightly again. The per unit requirements, especially those of capital for imports, might have increased because of 1972's Pakistan's devaluation and the prevailing higher interest rates. Anyway, the estimates of capital and labour requirements per million rupees worth of exports and import replacements, as reported in Table 1, and the resulting capital-labour ratios are expected to be very useful for the national economic planning of labour employment, economic growth and, trade and development of Pakistan's economy.

Now let us see, what else do the figures of Table 1 tell us? According to Heckscher-Ohlin's Factor Endowment Trade Theory, Pakistan — as a labour-abundant economy— should be exporting labour-intensive goods. A positive empirical verification of H-O Theorem requires, in quantitative terms, that Pakistan's capital-labour ratio of exports should be smaller[9/] than that of imports i.e.,

$$\left(\frac{K}{L}\right)^{*}_{E} = \frac{K_E}{L_E} < \frac{K_M}{L_M} = \left(\frac{K}{L}\right)^{*}_{M} \quad \text{[9'/]} \qquad \text{---------- (10).}$$

9/ This statement gets clear with a little use of intuition. For the sake of illustration, say we begin with the equality case, i.e., the capital-labour ratio of exports is equal to that of imports. Now, for exports to be labour-intensive:

(i) either the production of each unit of exports will employ greater labour than that of imports,

(ii) or, the production of each unit of exports will require lesser capital than that of imports.

Either of the two above positions or both will, for sure, lead the capital-labour ratio of exports to be smaller than the capital-labour ratio of imports.

9'/ To help further some of the sharp, minute-looking eyes, we may point out as a clarification that we are using small (lower) k, and that to with an asterisk as k* for capital-labour ratio(s), and capital (upper) 'K' and 'L' for the absolute values of capital and labour.

The empirical results of Table 1 show that Pakistan's capital-labour ratios of exports are found to be invariably smaller than those of imports for 1962-63, 1969-70 and 1974-75. These empirical results[19] confirm that Pakistan's exports have been labour-intensive and thus consistent with the natural resource base. The above empirical finding positively supports Heckscher-Ohlin's classic Factor Endowment Theory of International Trade. And so it does not show any kind of Leontief's Paradox for Pakistan.

Following Leontief, the large figures of capital and labour requirements have been reduced into most concise and meaningful indices of comparative factor intensities, i.e., $\overset{*}{R}_1$, $\overset{*}{R}_2$ and Z. The indices reflect all the special characteristics of the factor requirements discussed above. For instance, $\overset{*L}{R}_1$ is the ratio of labour man-years employed per unit of exports to the labour man-years employed per unit of imports, i.e., $\overset{*L}{R}_1 = \frac{L_E}{L_M}$. The greater than unity the $\overset{*L}{R}_1$ is, the more labour-intensive the exports of an economy tend to be. For Pakistan, the $\overset{*L}{R}_1$ had the value of 2.22, 1.32 and 1.15 for 1962-63, 1969-70 and 1974-75, respectively. The values have remained greater to unity throughout the above time period. Which implies that

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19/ It may be especially interesting to note from the results of 1974-75 that the production of each unit of exports requires lesser capital and greater labour than that of import replacements. So, here it is not only the theoretically required necessary and sufficient criterion of relative capital-labour ratios, rather it is also the capital and labour requirements in their absolute form as such which very well support and satisfy our basic academic and research investigation goal even through all the simple logic and nice naked eyes that Pakistan's exports have been labour-intensive.

Pakistan's exports have had the tendency, though a bit on decline, to be labour-intensive.

The other ratio, viz. $\overset{*K}{R_1}$, is the ratio of capital required for the production of one unit of exports to the capital required for one unit of import replacements, i.e. $\overset{*K}{R_1} = \frac{K_E}{K_M}$. The lesser to the unity the $\overset{*K}{R_1}$ is, the less capital-intensive the exports (and the more capital-intensive the import replacements) of that country tend to be. In Pakistan's case, overtime, the values of $\overset{*K}{R_1}$ have shown a decrease, starting from the value of 1.42 to 1.15 and then to 0.85 . Which means, in relative terms, Pakistan's import replacements have been tending to employ greater capital per unit of output than Pakistan's exports. $\overset{*}{R_2}$, by its definition, is just the reverse of the ratio $\overset{*}{R_1}$, explained above.

Based upon the above ratios, Leontief (14, pp.111-112) builds an index of comparative capital-labour intensity, i.e. $Z = \frac{\overset{*L}{R_1}}{\overset{*K}{R_1}}$, and leads us to a very interesting policy implication for increasing labour absorption and expanding the volume of Pakistan's foreign trade.

In Table 1, $\overset{*L}{R_1} = \frac{L_E}{L_M}$ and $\overset{*K}{R_1} = \frac{K_E}{K_M}$ give the rate of substitution of competitive imports for each unit of exports based on the relative quantities of labour and capital required for their production. $\overset{*L}{R_1}$ exceeds $\overset{*K}{R_1}$ in all the years, i.e. the rate of substitution of competitive imports for exports is greater for labour. Which implies that an

increased labour absorption through the substitution of competitive imports for exports—say after meeting the domestic level of imports requirements—would raise the level of exports, which in turn with increased foreign exchange earnings could also help to raise the level of needed imports from abroad. Thus, an increased labour employment absorption would also help to expand the volume of Pakistan's foreign trade.

$^{*K}_{R_2} = \frac{K_M}{K_E}$ and $^{*L}_{R_2} = \frac{L_M}{L_E}$ give the rate of substitution of exports for each unit of competitive imports based on the relative quantities of capital and labour required for their production. $^{*K}_{R_2}$ exceeds $^{*L}_{R_2}$ in all the years, i.e. the rate of substitution of exports for each unit of competitive imports is greater for capital. Which means that an increased supply of capital, through the substitution of exports for competitive imports, would reduce the level of exports as well as imports. Which in turn with decreased foreign exchange earnings could further reduce the level of imports. So, an increase in the supply of capital would tend to reduce the volume of foreign trade.

The above conclusion that an increased labour employment[11/] absorption would tend to expand, and a rise in the supply of capital

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11/ Such a conclusion may, of course, seem more desirable under employment policy considerations. Whereas, pure import-substitution may appear more profitable against certain other national policy goals.

would contract the volume of Pakistan's foreign trade will hold so long as the index of comparative capital and labour intensities, i.e. $\frac{{}^{*}R_1^L}{{}^{*}R_1^K} = Z$, exceeds unity. I feel that Pakistan's economy worked in accord with above proposition during the 1960s, and accordingly the index value got adjusted downward from a value of 1.56 in 1962-63 to 1.15 in 1969-70. The index value again went up to 1.35 in 1974-75, thereby demanding Pakistan's economy to work in accordance with the above proposition to get to a better equilibrium position.

Having presented above the per unit estimates, now Table 2 shows how much of both capital and labour are employed and absorbed through Pakistan's Foreign Trade. For obtaining these estimates, we first calculate the average of the per unit capital and labour requirements of exports and imports, as reported for 1962-63, 1969-70 and 1974-75 through Table 1. We multiply the average per unit capital and labour requirements to the columns of annual total exports and imports, and so obtain the estimates of total capital and labour employed through Pakistan's foreign trade. The estimates of factors' total employment absorption along with their capital-labour ratios have been reported through Table 2 over the years of 1962-63 to 1974-75. The resulting estimates show that, on the average, Pakistan's annual exports have employed 6,013.6 million rupees worth of capital and 1,921,835 labour man-years. Whereas Pakistan's annual import replacements, on the average, have employed 9,309.0 million rupees worth of capital and 1,976,778 labour man-years. The

Table 2

Factors' Employment Absorption in Total Exports and Imports of Pakistan.

YEARS	Exports				Imports			
	E	K_E	L_E	k^*_E	M	K_M	L_M	k^*_M
1962-63	972.0	1791.4	567922	3.2	2737.1	4445.1	978435	4.5
1963-64	1035.7	1908.8	605128	3.2	2921.4	4744.4	104431	4.5
1964-65	1111.7	2048.8	649527	3.2	3615.3	5871.2	1292358	4.5
1965-66	1066.3	1965.1	622990	3.2	2802.9	4551.9	1001942	4.5
1966-67	1262.5	2326.8	737658	3.2	3429.3	5569.2	1225875	4.5
1967-68	1536.7	2832.1	897848	3.2	3330.6	5408.9	1190593	4.5
1968-69	1580.2	2912.4	923281	3.2	3031.4	4923.1	1083649	4.5
1969-70	1513.3	2789.1	884199	3.2	3364.8	5471.0	1204252	4.5
1970-71	1948.1	3590.3	1338187	3.2	3561.3	5783.5	1273054	4.5
1971-72	3210.4	5916.8	1875758	3.2	4057.2	6588.9	1450320	4.5
1972-73	8409.6	15499.0	4913500	3.2	8007.3	13003.9	2862380	4.5
1973-74	9185.1	16928.1	5366555	3.2	13243.7	21507.8	4734233	4.5
1974-75	9586.8	17668.5	5601297	3.2	20411.8	33148.7	7296592	4.5
Average	2622.6	6013.6	1921835	3.2	5734.9	9309.0	1976778	4.5

Notes:

E,(M) : Total Exports (Improts) in Million Rupees.

K_E,(K_M): Capital in Million Rupees Required for the Total Exports (Imports).

L_E,(L_M): Labour Man-Years Employed and Absorbed Through Total Exports (Imports).

$k^*_E = \frac{K_E}{L_E}$, ($k^*_M = \frac{K_M}{L_M}$) : Capital—Labour Ratio of Total Exports (Imports).

aggregate average capital-labour ratio of exports has been equal to 3.15 and, as it should be, lesser than the corresponding ratio of import replacements, which is 4.54.

Through the discussion and analysis of Table 1, it was established that Pakistan's exports are labour intensive. However, the question may still be as if how much labour-intensive have they remained over the years, i.e. how about their capital and labour intensity overtime? How the factor intensities have been responding to any of the changes in the compositions of exports and imports? To satisfy this type of concerns, we have constructed Table 3 and Table 4.

For constructing Table 3, we first compute the per unit capital and labour requirements for exports and imports of the base year, applying the complete methodological system with all the required data of 1962-63. For estimating the capital and labour requirements for each of the succeeding year, we use all the system and the data of the base year, except that now we feed in the foreign-trade vectors of export and import proportions of each of the succeeding year. So the difference in the per unit factor requirements of each succeeding year, as compared to that of the base year, will be attributable only to the changes in the nature and composition of the exports and imports of the later years. The resulting estimates of the per unit capital and labour requirements of the succeeding

Table 3

Factor Requirements per Million Rupees worth of Exports and Imports over 1962-63 to 1974-75: With 1962-63 as Base and Annually Changing Trade Vectors upto 1974-75.

YEARS	Exports					Imports				
	K	K Index	L	L Index	$K^* = \frac{K}{L}$	K	K Index	L	L Index	$K^* = \frac{K}{L}$
1962-63	2575852	100	992	100	2597	1814208	100	448	100	4051
1963-64	2620670	102	898	91	2918	1782194	98	448	100	3979
1964-65	2489301	97	827	83	3011	1883592	104	521	116	3618
1965-66	2601621	101	792	80	3287	1752555	97	433	97	4043
1966-67	2548010	99	796	80	3203	2068898	114	503	112	4111
1967-68	2707251	105	813	82	3330	1997833	110	484	108	4128
1968-69	2626907	102	752	76	3491	1808533	100	354	79	5110
1969-70	2617976	102	684	69	3828	2050475	113	388	87	5281
1970-71	2738766	106	715	72	3831	1779465	98	389	87	4575
1971-72	2822237	110	800	81	3526	1623582	89	436	97	3727
1972-73	2798194	109	733	74	3815	2196536	121	536	120	4095
1973-74	2822677	110	716	72	3943	2254498	124	506	113	4457
1974-75	2776467	108	785	79	3536	2163990	119	476	106	4543
Average	2672762	104	793	80	3409	1936643	107	456	102	4286

Notes:

K = Capital in Rupees

L = Labour Manyears

$$K\ \text{Index} = \frac{K^t}{K^o} \times 100 \qquad L\ \text{Index} = \frac{L^t}{L^o} \times 100$$

Where t = 1963-64 ....1974-75.

o = 1962-1963

years and their base-year indices, as reported in Table 3 and Table 4, indicate how much more labour-intensive or capital-intensive our exports and imports have become over the years as compared to their positions in the base year. Adopting the same rationale Table 4 has been prepared, except that this table is based on 1969-70 as the base year.

As far as capital intensity of Pakistan's production structure is concerned, it has been remarked in various other studies (6, p.212, 7,p.406, 9,p.353, 16,p.400) that increasingly capital-intensive technology has been used in Pakistan. These remarks mainly relate to the excessive capital (capacity) installation whose major proportion has been found unutilized (8, 27, 28). This started happening around our first base year, viz. 1962-63, when excessive capital accumulation occurred because of under-priced capital imports through overvalued exchange rate, low interest rates and other incentives given against import substitution. Private foreign investment and tied foreign aid also added to capital accumulation. Azizur Rahman Khan (12, p.34) concludes from international comparisons of factor intensities that Pakistani capital intensities are close to the American level in a number of industries, while in certain cases they are even higher. In this respect, our results show that, on the average, the capital requirements per unit of exports have increased by four percent of the capital requirements of the base years, 1962-63 and 1969-70.

Table 4

Factor Requirements per Million Rupees worth of Exports and Imports over 1969-70 to 1974-75: With 1969-70 as Base and Annually Changing Trade Vectors upto 1974-75.

	Exports					Imports				
YEARS	K	K Index	L	L Index	$k^* = \frac{K}{L}$	K	K Index	L	L Index	$k^t = \frac{K}{L}$
1969-70	1373483	100	345	100	3980	1195975	100	262	100	4559
1970-71	1318262	96	333	97	3957	1252437	105	271	103	4619
1971-72	1560280	114	407	118	3830	1468238	123	306	117	4800
1972-73	1380544	101	349	101	3960	1478845	124	339	129	4358
1973-74	1363195	99	343	99	3975	1494600	125	347	132	4304
1974-75	1548257	113	414	120	3738	1512255	126	324	123	4675
Average	1424004	104	365	106	3907	1400392	117	308	117	4552

Notes:

K = Capital in Rupees

L = Labour Manyears

K Index $= \frac{K^t}{K^o} \times 100$

L Index $= \frac{L^t}{L^o} \times 100$

Where t = 1970-71 to 1974-75

o = 1969-70

The capital requirements per unit of import replacements increased, on the average, by seven percent of the capital requirements of 1962-63 and by seventeen percent of the capital requirements of 1969-70.

Although Pakistan's exports have been confirmed as labour-intensive, yet the per unit labour employment of Pakistan's exports appears, on the average, to have decreased by twenty percent of the labour employment of the base year, 1962-63. Which is a bit worrying. However, may be it was realized by the economic agents in the economy and, in the early Seventies the per unit labour employment of Pakistan's exports, on the average, increased by six percent of the base year, 1969-70. The labour employment per unit of Pakistan's import replacements got increased, on the average, by two percent of 1962-63 and by seventeen percent of the base year, 1969-70. In view of the above results, Pakistan government is strongly recommended to take such policy measures as ensure that less capital-intensive and more labour-intensive production processes are adopted in the economy.

V. CONCLUSIONS AND POLICY RECOMMENDATIONS

As far as positive economics' analysis is concerned, the study based on input-output production structure of the economy, using Leontief's methodological framework, presents estimates of capital and labour required for the output of a million rupees worth of Pakistan's exports and import replacements for 1962-63, 1969-70 and 1974-75. The resulting estimates show that Pakistan's exports have been labour-intensive and so consistent with the natural, national resource base. Thus, the study on theoretical side supports Heckscher-Ohlin's Factor Endowment Theory of International Trade. And it does not show any kind of Leontief's Paradox for Pakistan. However, Leontief's index of comparative capital and labour intensities has been discussed. Which very well guides us about the mechanism of an interesting policy recommendation for enhancing labour employment absorption and expanding the volume of Pakistan's foreign trade. The analysis of capital and labour requirements helps measuring the effects of changes in trade policy on factors' employment absorption and assists developmental planning which is of utmost importance for the overall accelerated economic development of an economy like our.

The study submits the estimates of factors' total employment absorption through Pakistan's foreign trade over the years from 1962-63 to 1974-75. It examines the changes in capital and labour intensities as compared to those of the base years of 1962-63 and 1969-70. The paper presents updated input-output coefficient matrices for Pakistan. It also ascertains the structural stability of Pakistan's exports and imports, and the relationship between the direct and total (direct and indirect) capital and labour requirements for 1962-63, 1969-70 and 1974-75.

For some aspects of the normative[12/] economics, in relation to this study, we feel like making the following policy recommendations. Pakistan being rich neither in physical capital resources, nor in any natural resources like oil or minerals is so primarily left with human-capital and the labour force as basic factor of economic development. The Government is, therefore, strongly urged to actively mobilize Pakistan's labour force. All the unemployed and under-employed labour force must be brought out of their homes in the rural as well as the urban areas. With their basic education, they should be equipped with productive training and skills at some vocational, technical training institutions in the country.

The trained labour force should be employed and absorbed intensively through the labour-intensive exports of Pakistan. According to Leontief's proposition, as long as Pakistan's index

12/ Purely professionally speaking, these normative aspects might not necessarily follow from our positive economics analysis. However, they do fit in the overall context of our present research work. And, since they have been marked as normative aspects anyway, so I don't mind putting them as a record of my remarks at the end of my research paper. I hope the readers may also kindly take these remarks with similar sort of spirits.

of comparative capital and labour intensities stands higher to unity, more labour can be employed through import replacements and, Pakistan's volume of foreign trade can also be increased. Along with the above suggested greater domestic labour employment absorption, Pakistan Government must also encourage the labour migration upto every possible extent to the capital-surplus countries of the world. The labour migrated abroad should be provided all the incentives to earn well and send back home their greater foreign exchange remittances. Which will help the nation to maintain better foreign exchange reserves as well as better foreign exchange rate of the national currency in the international markets and monetary institutions. Whereas the remittances will be directly raising the income levels of the concerned individual families at home. The labour migration abroad also contracts the domestic labour supply and results in higher wage rates for the labour at home. The above discussed greater employment absorption of labour force in Pakistan's exports and import replacements coupled with the wage rate increases helps the poor labour to gain in terms of their greater wage share in the GNP. Thus, the entire above process may also lead towards an equitable income distribution within the economy.

As yet we have not reached such a stage of "Economic Development" that we could forget "Economic Growth" or could assign "Growth" lesser priorities than the provision of "Basic Needs" in

the plans of our national economic objective (Preference) functions. Rather I shall strongly recommend that through greater employment absorption, greater migration and foreign trade, building up stronger industrial sector, and boosting our agriculture as a nation we must try hard for achieving higher level of economic growth. And for the accomplishment of such important national economic goals, rather any haphazard manner, we should be planning our national economic policy targets and tools through some compact general equilibrium framework assigning simultaneously appropriate priorities and weights to economic growth, equity, efficiency, distribution and stabilization. With this type of planning, raising our national income levels, we should be earning a higher place for our nation on the scene and horizon of "International Economic Order".

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STATISTICAL APPENDIX

Table 5 Appendix

Sectoral Codes, Prices, Ranked Direct and Total (Direct and Indirect)Capital and Labour Requirements for 1962-63, 1969-70 and 1974-75.

Industries' Serial Code Numbers	Name of Industry	Weighted Price Indices		
		1962-63	1969-70	1974-75
		P_i	P_i	P_i
(1)	(2)	(3)	(4)	(5)
01	Rice growing and Processing	96.0	119.6	260.1
02	Wheat growing and Processing	101.4	129.0	294.2
03	Cotton Growing and Ginning	96.6	114.5	235.2
04	All Other Agriculture Forestry and Fishry	107.5	138.85	272.14
05	Sugar Refining & Gur Making	92.8	113.7	263.75
06	Edible Oils	95.3	137.4	247.0
07	Cigarettes, Biri and other Tobbacco Products	118.5	141.1	323.5
08	Other Food and Drinks	103.48	133.63	278.94
09	Cotton Textiles	100.41	123.59	219.05
10	Other Textiles	100.57	151.27	331.95
11	Paper and Paper Products	114.1	135.4	193.2
12	Printing and Publishing	94.02	143.76	205.13
13	Leather & Leather Products	89.4	142.5	162.6
14	Rubber & Rubber Products	96.3	121.9	218.0
15	Fertilizer	98.6	131.0	152.0
16	Industrial Chemicals(Excluding Fertilizer)	90.27	111.88	347.95
17	Non-industrial Chemicals (Drug Pharms. & others)	84.2	90.6	168.55
18	Cement and Concrete	111.6	148.3	238.0
19	Basic Metals	110.86	226.46	519.19
20	Metal Products	106.9	188.3	431.7
21	Electrical Machinery	100.1	142.8	261.9
22	Non-Electrical Machinery	99.2	112.4	242.6
23	Motor Vehicles	105.01	132.03	284.85
24	Other (Transp. equipment)	105.01	132.03	284.85
25	Wood Cork & Furniture	95.01	180.5	421.65
26	Construction	104.6	130.94	284.83
27	Miscellaneous Manufacturing	105.01	132.03	284.85
28	Coal and Petroleum Products	100.5	144.1	584.15
29	Electricity and Gas	105.2	125.0	133.19
30	Transport	105.23	142.4	287.57
31	Trade	104.23	142.89	287.55
32	Government	106.34	135.73	284.94
33	Services n.e.s.	104.23	143.07	259.64
40	Total Current Inputs.			
100	Gross value of Production (Million Rupees)			

Contd.....

Table 5

Appendix

Sectoral Codes, Prices, Ranked Direct and Total (Direct and Indirect) Capital and Labour Requirements for 1962-63, 1969-70 and 1974-75.

Industries' Serial Code Numbers	Direct Capital and Labour Requirements per Million Rupees of Output (Input Coefficients).							
	1962-63				1969-70			
	Capital K_i	K_i Coeffts' Ranks	Labour l_i	l_i Coeffts' Ranks	Capital K_i	K_i Coeffts' Ranks	Labour l_i	l_i Coeffts' Ranks
	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
01	2108	5	869.77	4	2108	4	656.38	3.5
02	2482	4	866.48	6	2482	3	656.39	3.5
03	2055	6	870.19	3	2055	5	656.53	2
04	926	14	867.69	5	926	11	657.28	1
05	764	20	32.48	28	145	31	14.0	31
06	568	24	20.9	32	122	32	14.0	31
07	570	23	25.61	31	210	29	16.0	28.5
08	664	22	30.29	29	440	19	16.0	28.5
09	1584	8	118.91	18	598	12	66.0	15
10	763	21	94.04	20	149	30	51.0	18
11	313	32	42.26	25	1153	10	36.0	21
12	352	30	279.69	10	515	15	72.0	11
13	470	27	46.27	24	113	33	17.0	27
14	850	16	115.78	19	472	17	34.0	23
15	5878	1	81.59	22	212	28	24.0	25
16	417	28	40.13	26	318	24	21.0	26
17	385	29	40.02	27	531	14	25.0	24
18	1810	7	57.84	23	1854	6	42.0	20
19	538	26	92.44	21	469	18	35.0	22
20	806	18	129.39	17	414	20	71.0	12
21	553	25	164.92	12	597	13	47.0	19
22	285	33	156.98	13	409	21	74.0	10
23	782	19	152.22	15	496	16	70.0	13.5
24	1079	13	153.89	14	256	25	70.0	13.5
25	912	15	133.86	16	240	26.5	59.0	16
26	320	31	358.78	9	320	23	397.0	5
27	838	17	20.06	30	240	26.5	14.0	31
28	1217	11	3.58	33	350	22	3.58	33
29	5165	2	541.39	7	5165	1	114.0	9
30	2710	3	247.29	11	2710	2	297.0	6
31	1381	9	459.51	8	1381	7	281.0	7
32	1166	12	940.36	2	1166	9	255.66	8
33	1377	10	992.52	1	1377	8	56.21	17

Notes:

Coeffts. = Coefficients.

K_i = Capital in thousand rupees per million rupees of putput.

L_i = Labour man-years per million rupees of output.

Contd.....

Appendix

Table 5

Sectoral Codes, Prices, Ranked Direct and Total (Direct and Indirect) Capital and Labour Requirements for 1962-63, 1969-70 and 1974-75.

Industries' Serial Code Numbers	Direct and Indirect (Total) Capital and Labour Requirements per million rupees of Output.							
	1962-63				1969-70 computed with (1962-63) Input Coefficients.			
	Cap.Req. k*	K* Ranks	Lab. Req. L*	L* Ranks	Cap.Req. k**	k** Ranks	Lab. Req. L**	L** Ranks
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
01	3127	7	1118.56	4	3182	6	1125.3	4
02	3480	4	1297.35	1	3489	4	1293.0	1
03	2886	8	1199.95	2	2942	8	1216.0	2
04	1564	21	1121.39	3	1593	19	1129.0	3
05	2630	9	887.41	7	2052	12	847.3	7
06	1982	14	665.41	11	1814	17	578.6	10
07	1435	25	531.80	13	1508	22	262.7	24
08	1522	22	286.55	24	1543	20	290.5	23
09	3806	3	677.49	10	3839	3	683.5	9
10	2362	11	417.76	17	2188	9	381.2	17
11	681	31	160.05	30	823	30	202.0	29
12	772	28	414.05	18	717	32	394.0	15
13	477	33	179.24	28	1029	28	207.5	28
14	1864	15	477.84	15	1898	14	487.1	14
15	7868	1	314.51	21	7766	1	304.6	22
16	753	29	134.69	32	599	33	91.5	33
17	694	30	126.83	33	889	29	181.8	30
18	3168	6	175.38	29	3172	7	175.6	31
19	2618	10	472.17	16	2093	11	377.6	18
20	2340	12	404.19	19	2104	10	363.1	19
21	1305	27	301.77	23	1509	21	337.3	20
22	671	32	227.13	27	770	31	244.4	26
23	1307	26	267.74	25	1850	15	393.7	16
24	1796	16	311.72	22	1372	27	220.1	27
25	1731	18	685.22	9	1463	25	498.2	12
26	1635	20	550.68	12	1397	26	518.1	11
27	1789	17	233.13	26	1846	16	246.3	25
28	2042	13	139.28	31	2015	13	134.6	32
29	7012	2	738.82	8	7024	2	740.0	8
30	3334	5	321.39	20	3368	5	328.3	21
31	1491	23	496.97	14	1487	23	496.3	13
32	1717	19	1052.81	5	1728	18	1053.9	5
33	1486	24	1018.15	6	1480	24	1016.8	6

Notes:

Cap. Req. = Capital Requirement in thousand rupees per million rupees of output.

Lab.Req. = Labour Requirement in man-years per million rupees of output.

Contd.....

Appendix

Table 5

Sectoral Codes, Prices, Ranked Direct and Total (Direct and Indirect) Capital and Labour Requirements for 1962-63, 1969-70 and 1974-75.

Industries' Serial Code Numbers	Direct and Indirect (Total) Capital and Labour Requirements per million rupees of Output.											
	1969-70 computed with (1969-70) Input Coeffts.				1974-75 computed with (1962-63) input coeffts.				1974-75 computed with 1969-70 input coeffts.			
	Cap. Req. k^{***}	K^{***} Ranks	Lab. Req. L^{***}	L^{***} Ranks	Cap. Req. k^{****}	K^{****} Ranks	Lab. Req. L^{****}	L^{****} Ranks	Cap. Req. k^{*****}	K^{*****} Ranks	Lab. Req. L^{*****}	L^{*****} Ranks
	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33
01	2199	8	687.0	4	2661	8	1068.9	4	2200	9	687.5	4
02	2775	5	755.2	3	3302	6	1249.0	1	2787	6	762.1	3
03	2548	6	764.4	2	2890	7	1209.9	2	2575	7	767.4	2
04	3251	4	1278.2	1	1575	20	1131.0	3	3130	5	1247.7	1
05	174	31	15.2	33	1886	14	747.8	8	176	31	15.3	33
06	158	32	17.0	31	1940	13	649.5	10	155	32	16.8	31
07	210	30	16.0	32	1391	25	500.9	13	210	30	16.0	32
08	446	23	18.3	29.5	1516	21	278.1	25	446	24	18.3	30
09	918	18	107.1	16	3990	3	746.2	9	910	16	105.1	16
10	258	28	82.0	22	2033	9	351.4	18	265	28	82.7	21
11	1363	12	51.4	26	863	29	217.4	29	1286	13	45.6	27
12	665	20	83.0	21	839	30	434.7	16	710	21	86.1	20
13	153	33	23.0	28	1309	28	315.1	23	153	33	23.0	28
14	699	19	66.1	23	1994	10	525.3	12	622	23	56.6	24.5
15	411	25	84.0	20	8626	1	379.7	17	320	25.5	56.6	24.5
16	460	22	35.1	27	645	33	102.9	32	746	18	65.1	22
17	922	17	63.9	24	788	31	151.1	31	735	19	46.0	26
18	2515	7	122.5	14	3492	5	194.2	30	2517	8	125.4	14
19	1806	10	350.3	8	1972	12	345.4	19	1869	10	436.5	7
20	945	15	162.8	13	1991	11	333.9	20	995	15	179.7	12
21	928	16	90.9	19	1438	24	315.6	22	1044	14	98.1	19
22	577	21	96.2	18	770	32	239.6	27	623	22	98.5	18
23	1179	14	166.5	12	1311	27	265.5	26	831	17	116.1	15
24	444	24	96.5	17	1802	15	308.7	24	714	20	132.9	13
25	250	29	59.6	25	1386	26	451.6	15	255	29	59.8	23
26	320	26	397.0	7	1704	19	568.4	11	320	25.5	397.0	8
27	293	27	18.3	29.5	1741	16	217.7	28	297	27	18.8	29
28	1975	9	201.4	11	1716	17	67.3	33	3831	3	371.6	9
29	7331	1	224.0	10	7185	2	752.0	7	7166	1	192.6	11
30	4121	2	557.4	6	3639	4	320.7	21	3942	2	480.7	6
31	3408	3	655.0	5	1480	23	493.1	14	3392	4	649.4	5
32	1302	13	279.6	9	1705	18	1045.9	5	1307	12	279.9	10
33	1742	11	107.6	15	1500	22	1019.4	6	1715	11	101.7	17

Notes: Coeffts. = Coefficients.

Cap. Req. = Capital Requirement in thousand rupees per million rupees of output.

Lab.Req. = Labour Requirement in man-years per million rupees of output.

Contd.....

Appendix

Table 5.1

Spearman's Rank (SR_i) and Simple Correlation Coefficients (r_i) between Sectoral Factor Requirements over the Years. (The pairs of variable numbers correspond to the column numbers of Table 5).

Variable No.	6,8	6,10	8,12	10,12	14,16	14,18	16,20	18,20	18,22	18,26	20,24	20,28	22,24	22,30	24,32	26,28	30,32
SR_i	0.39	0.50	0.91	0.67	0.45	0.92	0.95	0.39	0.37	0.93	0.47	0.91	0.81	0.98	0.98	0.44	0.81
t-Statistics	2.36	3.21	12.22	5.03	2.81	13.07	16.94	2.36	2.22	14.09	2.96	12.22	7.69	27.42	27.42	2.73	7.69
r_i	0.27	0.63	0.79	0.45	0.24	0.99	0.98	0.24	0.51	0.99	0.65	0.96	0.55	0.97	0.99	0.22	0.54
t-Statistics	1.56	4.52	7.17	2.81	1.38	39.07	27.42	1.38	3.30	39.07	4.76	19.09	3.67	22.22	39.07	1.26	3.57

Appendix

Table 6

Sectoral Proportions of Total Exports and Imports over 1962-63 to 1974-75 .

Industries' Serial Code Numbers	1962-63		1963-64		1964-65		1965-66	
	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i
01	0.1778	0.00001	0.10193	0.00001	0.10736	0.0	0.12428	0.000
02	0.0	0.08934	0.00078	0.10792	0.0	0.15850	0.0	0.083
03	0.4082	0.005	0.34998	0.00201	0.16773	0.00261	0.27998	0.0018
04	0.1782	0.06867	0.15957	0.05879	0.24665	0.05828	0.07312	0.0516
05	0.0049	0.01229	0.01190	0.00054	0.00506	0.01313	0.00481	0.0094
06	0.0007	0.00408	0.00053	0.00578	0.00969	0.00870	0.00809	0.0119
07	0.00004	0.00023	0.00006	0.00019	0.00005	0.00038	0.00005	0.0004
08	0.0431	0.00791	0.03728	0.01295	0.03708	0.01875	0.05135	0.0106
09	0.0902	0.00109	0.17775	0.00139	0.24114	0.00469	0.23454	0.0008
10	0.0122	0.01191	0.02978	0.01388	0.03012	0.01449	0.02628	0.0187
11	0.001	0.00763	0.00049	0.00801	0.00019	0.00789	0.00052	0.0013
12	0.00048	0.00259	0.00080	0.00350	0.00107	0.00296	0.00234	0.0023
13	0.0156	0.00057	0.03070	0.00045	0.04283	0.00031	0.07117	0.0001
14	0.0017	0.01535	0.00291	0.01574	0.00202	0.01897	0.00164	0.0134
15	0.00010	0.01665	0.00433	0.00822	0.0	0.00045	0.0	0.0200
16	0.0032	0.04351	0.00446	0.06177	0.00517	0.06700	0.00774	0.0607
17	0.0026	0.02243	0.01026	0.02922	0.01040	0.02558	0.01319	0.0214
18	0.0009	0.01768	0.00095	0.01801	0.00083	0.01290	0.00086	0.0171
19	0.0009	0.12271	0.00027	0.13043	0.00065	0.15495	0.00091	0.1032
20	0.0034	0.04243	0.00810	0.03391	0.00606	0.03290	0.00649	0.0311
21	0.0027	0.07995	0.00429	0.06393	0.00518	0.06209	0.00584	0.0795
22	0.0127	0.23201	0.00396	0.20938	0.00720	0.17376	0.01280	0.2494
23	0.0023	0.04606	0.00280	0.06424	0.00225	0.06177	0.00300	0.0712
24	0.0051	0.05935	0.00780	0.05680	0.00143	0.04816	0.00484	0.0624
25	0.00004	0.00562	0.00028	0.00796	0.00033	0.00522	0.00032	0.0111
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0303	0.02172	0.03509	0.02357	0.03302	0.01978	0.03593	0.0234
28	0.0015	0.06322	0.01294	0.06124	0.03650	0.02579	0.02991	0.0327
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Exports and Imports in thousand rupees	972016	2737107	1035684	2921435	1111692	3615291	1066268	2802865
Balance of Trade	-	-	-	DEFICIT	-	-	-	-

e_i = Sectoral export proportions of the given thirty three sectors.

m_i = Sectoral import proportions of the given thirty three sectors.

Contd.....

Appendix

Table 6

Sectoral Proportions of Total Exports and Imports over 1962-63 to 1974-1975.

Industries' Serial Code Numbers	1966-67		1967-68		1968-69		1969-70	
	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i
01	0.13932	0.00001	0.09722	0.00003	0.03819	0.0	0.06204	0.0
02	0.0	0.13768	0.00001	0.14704	0.00057	0.00177	0.0	0.01492
03	0.24177	0.00172	0.29800	0.00441	0.23047	0.00011	0.14785	0.00274
04	0.10599	0.07892	0.09008	0.55829	0.08758	0.05942	0.10277	0.10532
05	0.00900	0.00038	0.00396	0.00110	0.00216	0.02504	0.00738	0.00034
06	0.00844	0.00605	0.00296	0.00537	0.00237	0.00718	0.00150	0.00143
07	0.00082	0.00017	0.00057	0.00019	0.00016	0.00047	0.00111	0.00032
08	0.05036	0.00961	0.03784	0.00696	0.05045	0.00876	0.06241	0.01064
09	0.21672	0.00070	0.26429	0.00018	0.27450	0.00017	0.33810	0.00016
10	0.03592	0.01325	0.04327	0.00936	0.06350	0.01190	0.05841	0.00522
11	0.00056	0.01409	0.00018	0.00967	0.00044	0.00994	0.00072	0.00915
12	0.00059	0.00298	0.00105	0.00187	0.00133	0.00266	0.00153	0.00319
13	0.05970	0.00024	0.05776	0.00021	0.07662	0.00034	0.07741	0.00030
14	0.00127	0.01251	0.00115	0.01094	0.00138	0.01720	0.00271	0.01909
15	0.0	0.03961	0.00228	0.03695	0.00056	0.04323	0.0	0.08389
16	0.01086	0.02628	0.00921	0.05057	0.01218	0.07759	0.00794	0.07254
17	0.01204	0.02073	0.00974	0.00380	0.00921	0.02261	0.01014	0.02153
18	0.00537	0.01465	0.00702	0.01175	0.00824	0.01070	0.01326	0.01351
19	0.00096	0.13347	0.00012	0.09072	0.00014	0.12560	0.00013	0.10850
20	0.00668	0.02594	0.00453	0.02834	0.00412	0.03730	0.00484	0.03432
21	0.01599	0.06068	0.00540	0.06195	0.00536	0.07203	0.00315	0.06504
22	0.02138	0.19421	0.00213	0.23848	0.00281	0.21868	0.00433	0.21071
23	0.00460	0.06245	0.00016	0.04692	0.00034	0.05022	0.00035	0.04669
24	0.00278	0.05299	0.00027	0.05808	0.00014	0.04986	0.00077	0.054378
25	0.00012	0.01118	0.00027	0.01198	0.00032	0.02140	0.00040	0.00962
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.03245	0.02420	0.03529	0.02873	0.03715	0.03478	0.04821	0.02870
28	0.01630	0.05530	0.02524	0.07608	0.02973	0.09102	0.04253	0.07504
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Exports and Imports in thousand rupees	1262534	3429306	1536700	3330608	1590230	3031436	1513343	3364817
Balance of trade	-	-	- DEFICIT.		-	-	-	-

e_i = Sectoral export proportions of the given thirty three sectors.

m_i = Sectoral import proportions of the given thirty three sectors.

Contd.....

Appendix

Table 6

Sectoral Proportions of Total Exports and Imports over 1962-63 to 1974-75.

Industries' Serial Code Numbers	1970-71		1971-72		1972-73		1973-74		1974-75	
	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i
01	0.08879	0.00001	0.08538	0.00518	0.13510	0.0	0.22360	0.0	0.24030	0.0
02	0.00014	0.01774	0.0	0.06651	0.0	0.13889	0.0	0.11678	0.0	0.10605
03	0.14645	0.00120	0.30602	0.00231	0.14266	0.00067	0.04499	0.00081	0.16337	0.00030
04	0.08086	0.10533	0.05327	0.11666	0.07113	0.10364	0.07629	0.12269	0.06189	0.09788
05	0.03406	0.00026	0.00551	0.00682	0.00505	0.05395	0.00602	0.00983	0.01002	0.00021
06	0.00294	0.00014	0.00371	0.00262	0.00573	0.00347	0.00057	0.01776	0.00255	0.04722
07	0.00127	0.00016	0.00113	0.00014	0.00048	0.00008	0.00067	0.00005	0.00531	0.00002
08	0.03945	0.01067	0.04221	0.00921	0.03379	0.00818	0.03489	0.02235	0.01979	0.00968
09	0.34302	0.00018	0.30922	0.00007	0.38267	0.00012	0.35632	0.00003	0.23171	0.00008
10	0.08998	0.00715	0.04525	0.01007	0.04425	0.01512	0.07488	0.02531	0.09622	0.02032
11	0.00044	0.01083	0.00071	0.16498	0.00023	0.01655	0.00031	0.02895	0.00022	0.02513
12	0.00137	0.00323	0.00078	0.00177	0.00049	0.00172	0.00085	0.00107	0.00140	0.00082
13	0.06044	0.00052	0.05956	0.00049	0.08284	0.00104	0.05624	0.00116	0.04513	0.00050
14	0.00176	0.01774	0.00074	0.01279	0.00043	0.01139	0.00101	0.00947	0.00107	0.00631
15	0.0	0.03301	0.00278	0.01302	0.00046	0.04869	0.00007	0.06761	0.00038	0.05007
16	0.00490	0.07555	0.00332	0.06062	0.00220	0.08936	0.00869	0.07798	0.00454	0.06082
17	0.00534	0.01818	0.00350	0.02415	0.00239	0.02539	0.00349	0.01674	0.00471	0.01396
18	0.01163	0.01084	0.01404	0.00817	0.01212	0.00697	0.02129	0.00596	0.03030	0.00619
19	0.00018	0.12484	0.00019	0.10613	0.00006	0.11150	0.00179	0.09899	0.00053	0.11752
20	0.00454	0.04508	0.00299	0.02933	0.00301	0.02702	0.00481	0.01651	0.00583	0.01222
21	0.00421	0.07289	0.00134	0.06338	0.00146	0.05739	0.00069	0.04511	0.00272	0.05813
22	0.00373	0.18904	0.00228	0.14647	0.01446	0.09228	0.00192	0.08352	0.00331	0.10145
23	0.00045	0.05431	0.00022	0.03446	0.00007	0.04973	0.00011	0.04109	0.00005	0.04003
24	0.00036	0.08207	0.00015	0.01415	0.00133	0.01056	0.00142	0.04029	0.00033	0.02006
25	0.00026	0.00394	0.00017	0.00191	0.00039	0.00218	0.00052	0.00193	0.00050	0.00160
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.04787	0.02641	0.03833	0.02210	0.03848	0.02322	0.04915	0.02145	0.04996	0.01820
28	0.02556	0.08868	0.01721	0.07648	0.01872	0.10090	0.02143	0.12659	0.01787	0.18325
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Exports & Imports in thousand rupees	1948046	3561287	3210433	4057177	8409644	8007331	9185057	13243720	9586829	20411764
Balance of Trade	DEFICIT	-	-		SURPLUS		DEFICIT	-	-	

e_i = Sectoral export proportions of the given thirty three sectors.

m_i = Sectoral import proportions of the given thirty three sectors.

Table 6.1

Spearman's Rank Correlation Coefficients for Exports (SRe_i) and Imports' Proportions ($SR\ m_i$) over 1962-63 to 1974-75.

	1962-63		1963-64		1964-65		1965-66		1966-67		1967-68		1968-69		1969-70	
	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i
'74-75 SRe_i = '63-64	Base Year		0.9293		0.9171		0.9312		0.9401		0.8716		0.8593		0.8946	
(t-statistic)			(14.01)		(12.81)		(14.22)		(15.35)		(9.90)		(9.35)		(11.15)	
'74-75 $SR\ m_i$ = '63-64				0.9775		0.9602		0.9815		0.9748		0.9570		0.9066		0.9410
(t-statistic)	Base Year			(25.80)		(19.14)		(28.54)		(24.33)		(18.37)		(11.96)		(15.48)
'74-75 SRe_i = '70-71			-		-		-		-		-		-		Base Year	
(t-statistic)																
'74-75 $SR\ m_i$ = '70-71				-		-		-		-		-		-		Base Year
(t-statistic)																

'74-75 $SR\ e_i$ = '63-64 ('74-75 $SR\ m_i$ = '63-64) = Spearman's rank correlation coefficients of export proportions (import proportions) over 1963-64 to 1974-75. Each correlation coefficient has been computed in relation to the base year series of export proportions (import proportions) i.e., 1962-63.

'74-75 $SR\ e_i$ = '70-71 ('74-75 $SR\ m_i$ = '70-71) = Spearman's rank correlation coefficients of export proportions (import proportions) over 1970-71 to 1974-75. These correlation coefficients have been computed in relation to export proportion (import proportion) series of 1969-70 as the base year.

Contd....

Appendix

Table 6.1

Spearman's Rank Correlation Coefficients for Exports (SR e_i) and Imports' Proportions (SR m_i) over 1962-63 to 1974-75 .

	1970-71		1971-72		1972-73		1973-74		1974-75	
	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i	e_i	m_i
'74-75 SR e_i = '63-64	0.8898		0.8473		0.8929		0.9017		0.8476	
(t-statistic)	(10.86)		(8.88)		(11.04)		(11.61)		(8.89)	
'74-75 SR m_i = '63-64		0.9560		0.9166		0.9450		0.9188		0.9022
(t-statistic)		(18.14)		(12.76)		(16.09)		(12.96)		(11.65)
'74-75 SR e_i = '70-71	0.9841		0.9452		0.9582		0.9642		0.9586	
(t-statistic)	(30.85)		(16.12)		(18.65)		(20.24)		(18.74)	
'74-75 SR m_i = '70-71		0.9796		0.8854		0.8947		0.9160		0.9103
(t-statistic)		(27.14)		(10.61)		(11.15)		(12.71)		(12.24)

Table 7

Input-Output Coefficient Matrices for 1962-63, 1969-70 and 1974-75.

I \ J	01 Rice	02 Wheat	03 Cotton	04 All Other Agriculture, Forestry and Fishry	05 Sugar and Gur
01	0.03159*	0.05597	0.09227	0.00646	0.65240
	0.03159	0.05597	0.09227	0.0065	0.6615
	0.03159	0.05597	0.09227	0.00691	0.58110
04	0.12276	0.28719	0.15863	0.04038	0.00015
	0.1224	0.2804	[illegible]	0.0414	0.0002
	0.11470	0.25058	0.16493	0.04628	0.00011
15	0.02465	0.02776	0.00038	0.01017	0.00917
	0.0263	0.0290	0.0004	0.0097	0.0047
	0.01402	0.01475	0.00034	0.00979	0.01244
16	0.00168	0.00600	0.000045	0.10633	0.00842
	0.0009	0.0054	0.00006	0.10633	0.0131
	0.00240	0.00541	0.00003	0.10639	0.00593
17	0.00155	0.00307	0.00005	0.000012	0.00015
	0.0023	0.0027	0.00004	0.000014	0.0001
	0.00114	0.00259	0.00005	0.00001	0.00014
21	0.00720	0.00150	0.01434	0.00172	0.00008
	0.0066	0.0017	0.0161	0.0018	0.0001
	0.00695	0.00300	0.00908	0.00183	0.00007
22	0.00369	0.00585	0.00929	0.00048	0.00195
	0.0033	0.0055	0.0089	0.0006	0.0023
	0.00333	0.00255	0.00999	0.00062	0.00398
28	0.01089	0.00980	0.00476	0.00558	0.00045
	0.0125	0.0102	0.0045	0.0060	0.0004
	0.02336	0.00923	0.00478	0.00339	0.00020
29	0.00371	0.03170	0.00688	0.00081	0.00861
	0.0035	0.0342	0.0083	[illegible]	0.0093
	0.00173	0.03015	0.01644	[illegible]	0.00828
30	0.12527	0.00014	0.00602	0.00074	0.10554
	0.1337	0.0001	0.0050	0.0012	0.1181
	0.12635	0.00013	0.00313	[illegible]	0.10245
31	0.03230	0.00136	0.02496	0.00137	0.00008
	0.0356	0.0015	0.0280	0.0019	0.00008
	0.03269	0.00117	0.02801	0.00219	0.00007
32	0.00048		0.02515	0.00172	0.00232
	0.0005		0.0291	[illegible]	0.0026
	0.00047		[illegible]	[illegible]	0.00283
33	0.00347		0.00067	0.00023	
	0.0038		0.0007	0.0003	
	0.00319		0.00074	0.00053	
			0.00574	0.00264	
			0.0066	0.0025	
			0.00587	[illegible]	
				0.01619	
				[illegible]	
				[illegible]	
				0.10210	
				0.1127	
				0.11127	
				[illegible]	
				[illegible]	
				[illegible]	
				0.00073	
				0.0008	
				0.00072	
40	0.36923	0.43033	0.34921	0.29860	0.78930
	0.3891	0.4294	0.3694	0.3136	0.8153
	0.36212	0.37553	0.36411	0.31318	0.71679
100	835.8	2204.8	1045.8	[illegible]	1336.0
	1041.24	2884.23	1239.5	[illegible]	1636.9
	2264.52	6397.01	2546.3	[illegible]	3797.05

*In each triplet set, the first entry relates to 1962-63, the second entry refers to 1969-70, and the third entry stands as a respective element of 1974-75 input-output coefficient matrix.

Table 7

Appendix

Input-Output Coefficient Matrices for 1962-63, 1969-70 and 1974-75.

i \ J	06 Edible Oils	07 Cigarettes and other Tobacco Products	08 Other Food and Drink	09 Cotton Textiles	10 Other Textiles
03	0.13215*	04	0.38088	04	0.02544	03	0.20398	04	0.01239
	0.1086		0.3974		0.0245		0.1964		0.0102
	0.12415		0.35319		0.02389		0.22765		0.00950
04	0.28593	11	0.01767	05	0.06359	04	0.00173	09	0.09126
	0.2454		0.022		0.0603		0.0017		0.0747
	0.27928		0.01096		0.06704		0.00201		0.06032
06	0.13079	12	0.02016	06	0.02410	09	0.30998	10	0.34159
	0.13079		0.0157		0.0269		0.30998		0.34159
	0.13079		0.01611		0.02317		0.30997		0.34159
08	0.00017	16	0.00387	11	0.01501	10	0.01673	11	0.00168
	0.0002		0.002		0.0169		0.0204		0.0016
	0.00018		0.00546		0.00943		0.02532		0.00086
09	0.01209	17	0.00355	12	0.01712	11	0.00062	12	0.00191
	0.0103		0.0057		0.0121		0.0008		0.0012
	0.01018		0.00260		0.01386		0.00048		0.00126
16	0.00355	21	0.00227	16	0.02198	12	0.00070	16	0.00850
	0.0016		0.0022		0.0108		0.0005		0.0036
	0.00528		0.00218		0.03143		0.00070		0.00992
17	0.00326	22	0.00117	17	0.02018	16	0.03717	17	0.00780
	0.0043		0.0011		0.0297		0.0191		0.0098
	0.00252		0.00104		0.01499		0.06567		0.00473
20	0.00187	28	0.00054	21	0.00929	17	0.03413	21	0.00409
	0.0023		0.0007		0.0082		0.0527		0.0031
	0.00292		0.00116		0.00902		0.03131		0.00325
21	0.00113	29	0.00181	22	0.00476	21	0.00503	22	0.00210
	0.0009		0.0018		0.0041		0.0046		0.0016
	0.00114		0.00084		0.00432		0.00604		0.00156
22	0.00058	30	0.01756	25	0.00134	22	0.00258	28	0.00750
	0.0004		0.0196		0.002		0.0024		0.0072
	0.00054		0.01758		0.00220		0.00289		0.01320
28	0.00732	31	0.09739	27	0.01606	28	0.00866	29	0.01499
	0.0073		0.1121		0.0157		0.0101		0.0119
	0.01642		0.09842		0.01617		0.02308		0.00575
29	0.00920	32	0.00054	28	0.00602	29	0.01742	30	0.01467
	0.0076		0.0006		0.0067		0.0168		0.013
	0.00449		0.00053		0.01299		0.01011		0.01214
30	0.00903	33	0.00978	29	0.00803	30	0.00647	31	0.14733
	0.0083		0.0113		0.0074		0.007		0.1343
	0.00952		0.00802		0.00377		0.00811		0.12314
31	0.09894			30	0.04485	31	0.11904	32	0.00163
	0.0941				0.0462		0.1326		0.0014
	0.10532				0.04546		0.15053		0.00132
32	0.00136			31	0.20549	32	0.00091	33	0.00847
	0.0012				0.2182		0.0009		0.0077
	0.00141				0.21031		0.00112		0.00640
33	0.00647			32	0.00335	33	0.00666		
	0.0062				0.0033		0.0074		
	0.00622				0.00333		0.00760		
40	0.70385	40	0.55721	33	0.00870	40	0.77182	40	0.66591
	0.6309		0.5927		0.0092		0.7839		0.6292
	0.70035		0.51900		0.00804		0.87260		0.59494
100	587.2	100	552.4	40	0.49531	100	2193.4	100	306.8
	846.6		657.7		0.5082		2700.1		461.5
	1521.9		1508.05		0.49941		4785.12		1012.6
				100	149.4				
					192.9				
					402.72				

*In each triplet set, the first entry relates to 1962-63, the second entry refers to 1969-70, and the third entry stands as a respective element of 1974-75 input-output coefficient matrix.

Contd.....

Input-Output Coefficient Matrices for 1962-63, 1969-70 and 1974-75.

i \ j	11 Paper & Paper Products	12 Printing & Publishing	13 Leather & Leather Products	14 Rubber & Rubber Products	15 Fertilizer
04	0.01336*	04 0.01523	04 0.07560	04 0.15447	21 0.00659
	0.0175	0.0125	0.0589	0.1516	0.0056
	0.01997	0.01768	0.10522	0.17274	0.01118
11	0.04636	11 0.05289	09 0.00338	09 0.01626	22 0.00338
	0.0723	0.0517	0.0026	0.0157	0.0029
	0.04636	0.04105	0.00405	0.01567	0.00536
12	0.05289	12 0.06033	11 0.00205	11 0.00190	28 0.07752
	0.0517	0.0369	0.0019	0.0023	0.0837
	0.06815	0.06033	0.00191	0.00142	0.29228
16	0.01709	16 0.01949	12 0.00234	12 0.00217	29 0.16611
	0.0114	0.0081	0.0014	0.0016	0.1485
	0.03890	0.03444	0.00280	0.00209	0.13643
17	0.01569	17 0.01790	13 0.26088	14 0.04472	30 0.15504
	0.0314	0.0225	0.2609	0.0446	0.1551
	0.01855	0.01642	0.26088	0.04472	0.27484
21	0.00722	21 0.00824	14 0.00371	16 0.04450	31 0.09192
	0.0086	0.0062	0.0029	0.0222	0.0949
	0.01116	0.00988	0.00462	0.07577	0.16449
22	0.00370	22 0.00422	16 0.01918	17 0.04086	33 0.00111
	0.0044	0.0031	0.0076	0.0613	0.0012
	0.00535	0.00473	0.04064	0.03613	0.00179
28	0.00516	28 0.00589	17 0.01761	21 0.01612	
	0.0078	0.0056	0.0210	0.0145	
	0.01771	0.01568	0.01938	0.01864	
29	0.00668	29 0.00762	20 0.00945	22 0.00827	
	0.0083	0.0060	0.0104	0.0073	
	0.00499	0.00442	0.02098	0.00893	
30	0.00759	30 0.00866	21 0.00625	28 0.01220	
	0.0106	0.0076	0.0044	0.0138	
	0.01225	0.01084	0.00899	0.03131	
31	0.09318	31 0.10630	22 0.00320	29 0.01626	
	0.1345	0.0961	0.0023	0.0154	
	0.15182	0.13441	0.00431	0.00909	
32	0.00121	32 0.00138	27 0.00169	30 0.02439	
	0.0016	0.0012	0.0013	0.0257	
	0.00192	0.00170	0.00252	0.02944	
33	0.01032	33 0.01177	28 0.00270	31 0.19106	
	0.0149	0.0107	0.0024	0.2068	
	0.01518	0.01344	0.00863	0.23283	
			29 0.00675	32 0.00406	
			0.0050	0.0042	
			0.00470	0.00481	
			30 0.00979	33 0.01626	
			0.0082	0.0177	
			0.01471	0.01789	
			31 0.04117		
			0.0354		
			0.06245		
			32 0.00034		
			0.0003		
			0.00050		
			33 0.00135		
			0.0012		
			0.00185		
40	0.28046	40 0.31993	40 0.46743	40 0.59350	40 0.50166
	0.3754	0.2685	0.4281	0.6086	0.5479
	0.41231	0.36503	0.56915	0.70148	0.88636
100	71.89	100 82.01	100 296.3	100 24.6	100 90.3
	106.51	76.11	472.3	31.1	120.0
	260.60	335.80	538.9	55.7	139.2

*In each triplet set, the first entry relates to 1962-63, the second entry refers to 1969-70, and the third entry stands as a respective element of 1974-75 input-output coefficient matrix.

Contd.....

Input-Output Coefficient Matrices for 1962-63, 1969-70 and 1974-75.

16 Industrial Chemicals		17 Non-industrial Chemicals		18 Cement & Concrete		19 Basic Metals		20 Metal Products	
03	0.01920*	03	0.01763	11	0.00471	16	0.00299	04	0.00058
	0.0094		0.0258		0.0052		0.0009		0.0004
	0.01213		0.02144		0.00374		0.00246		0.00036
04	0.00768	04	0.00705	12	0.00538	17	0.00275	11	0.00256
	0.0039		0.0109		0.0038		0.0026		0.0022
	0.00504		0.00892		0.00550		0.00117		0.00107
05	0.00106	05	0.00097	16	0.00169	19	0.51926	12	0.00292
	0.0005		0.0015		0.0008		0.5193		0.0015
	0.00078		0.00138		0.00306		0.51929		0.00158
06	0.00185	06	0.00170	17	0.00156	21	0.00670	16	0.00631
	0.0011		0.0030		0.0022		0.0037		0.0023
	0.00125		0.00220		0.00146		0.00374		0.00602
11	0.00167	11	0.00153	18	0.24658	22	0.00344	17	0.00579
	0.0010		0.0028		0.2466		0.0019		0.0062
	0.00073		0.00130		0.24658		0.00179		0.00287
12	0.00191	12	0.00175	21	0.01085	23	0.00828	19	0.24366
	0.0008		0.0020		0.0093		0.0095		0.2826
	0.00108		0.00191		0.01331		0.00480		0.28257
16	0.05482	16	0.05033	22	0.00556	24	0.01131	20	0.10801
	0.0143		0.0394		0.0047		0.0026		0.1080
	0.05482		0.09691		0.00638		0.00655		0.10801
17	0.05033	17	0.04621	25	0.00239	28	0.01655	21	0.00571
	0.0394		0.1086		0.0034		0.0116		0.0037
	0.02614		0.04621		0.00498		0.02054		0.00370
21	0.00245	21	0.00225	27	0.00342	29	0.01892	22	0.00293
	0.0011		0.0032		0.0032		0.0110		0.0019
	0.00166		0.00294		0.00435		0.00511		0.00177
22	0.00126	22	0.00115	28	0.04292	30	0.08446	28	0.03370
	0.0006		0.0016		0.0463		0.0550		0.0274
	0.00080		0.00141		0.11698		0.04928		0.04850
27	0.00702	27	0.00644	29	0.00992	31	0.13885	29	0.02765
	0.0036		0.0101		0.0089		0.0932		0.0187
	0.00494		0.00873		0.00589		0.08179		0.00867
28	0.00371	28	0.00341	30	0.10448	32	0.00203	30	0.04752
	0.0022		0.0060		0.1045		0.0013		0.0359
	0.00559		0.00989		0.13388		0.00116		0.03216
29	0.00477	29	0.00438	31	0.01077	33	0.01047	31	0.12730
	0.0023		0.0065		0.0111		0.0070		0.0991
	0.00157		0.00277		0.01394		0.00557		0.08697
30	0.00861	30	0.00790	32	0.00068			32	0.00144
	0.0047		0.0130		0.0007				0.0010
	0.00610		0.01079		0.00086				0.00096
31	0.05788	31	0.05314	33	0.01077			33	0.00461
	0.0327		0.0901		0.0111				0.0036
	0.04142		0.07323		0.01258				0.00284
32	0.00159	32	0.00146						
	0.0008		0.0023						
	0.00110		0.00195						
33	0.00596	33	0.00547						
	0.0034		0.0093						
	0.00385		0.00681						
40	0.23178	40	0.21279	40	0.46170	40	0.82601	40	0.62068
	0.1219		0.3363		0.4897		0.7196		0.5945
	0.16902		0.29879		0.55956		0.70209		0.58805
100	205.18	100	188.38	100	584.8	100	296.0	100	347.2
	129.76		358.05		777.1		604.6		611.6
	1517.10		787.90		1247.1		1386.3		1402.1

*In each triplet set, the first entry relates to 1962-63, the second entry refers to 1969-70, and the third entry stands as a respective element of 1974-75 input-output coefficient matrix.

Input-Output Coefficient Matrices for 1962-63, 1969-70 and 1974-75.

21 Electrical Machinery		22 Non-elec.. trical Mach-inery		23 Motor Vehicles		24 Other (Transport Equipment)		25 Wood, Cork & Furniture	
04	0.00308 *	04	0.00158	04	0.00082	04	0.00111	04	0.47950
	0.0042		0.0021		0.0015		0.0004		0.3138
	0.00298		0.00163		0.00076		0.00104		0.27377
09	0.00077	09	0.00039	14	0.08049	14	0.10997	11	0.00049
	0.0009		0.0004		0.1505		0.0413		0.0004
	0.00064		0.00035		0.06717		0.09178		0.00019
16	0.00411	16	0.00211	16	0.00036	16	0.00050	12	0.00056
	0.0023		0.0012		0.0003		0.0001		0.0003
	0.00605		0.00332		0.00052		0.00071		0.00028
17	0.00377	17	0.00193	17	0.00033	17	0.00046	16	0.00219
	0.0063		0.0032		0.0010		0.0002		0.0007
	0.00289		0.00158		0.00025		0.00034		0.00191
20	0.14134	20	0.07245	19	0.01782	19	0.02435	17	0.00201
	0.2204		0.1120		0.0537		0.0148		0.0021
	0.21815		0.11964		0.03077		0.04204		0.00091
21	0.08683	21	0.04451	20	0.01363	20	0.01862	20	0.00946
	0.0873		0.0444		0.0355		0.0097		0.0088
	0.08683		0.04762		0.02029		0.02772		0.00862
22	0.04451	22	0.02282	21	0.00778	21	0.01063	29	0.00210
	0.0444		0.0225		0.0131		0.0036		0.0013
	0.04160		0.02282		0.00750		0.01025		0.00060
27	0.00058	27	0.00030	22	0.00399	22	0.00545	30	0.00631
	0.0007		0.0003		0.0066		0.0018		0.0044
	0.00060		0.00033		0.00359		0.00491		0.00389
28	0.01500	28	0.00769	23	0.05385	23	0.07358	32	0.00105
	0.0190		0.0097		0.1856		0.0510		0.0007
	0.03332		0.01827		0.05385		0.07358		0.00064
29	0.00885	29	0.00453	24	0.07358	24	0.10053	33	0.00421
	0.0093		0.0047		0.0510		0.0140		0.0030
	0.00428		0.00235		0.07358		0.10053		0.00236
30	0.04211	30	0.02159	28	0.00594	28	0.00812		
	0.0496		0.0252		0.0126		0.0034		
	0.04399		0.02412		0.01273		0.01739		
31	0.00904	31	0.00463	29	0.00349	29	0.00477		
	0.0109		0.0056		0.0061		0.0017		
	0.00953		0.00523		0.00163		0.00223		
32	0.00192	32	0.00099	30	0.00256	30	0.00350		
	0.0022		0.0011		0.0050		0.0014		
	0.00197		0.00108		0.00258		0.00353		
33	0.00942	33	0.00483	31	0.01107	31	0.01512		
	0.0115		0.0058		0.0224		0.0061		
	0.00897		0.00492		0.01125		0.01538		
				32	0.00140	32	0.00191		
					0.0027		0.0007		
					0.00138		0.00189		
				33	0.01013	33	0.01385		
					0.0206		0.0056		
					0.00931		0.01272		
40	0.37132	40	0.19038	40	0.28725	40	0.39247	40	0.50789
	0.469		0.2382		0.5682		0.1588		0.3355
	0.46179		0.25326		0.30842		0.39064		0.29316
100	227.29	100	116.51	100	153.32	100	209.48	100	95.1
	258.32		131.22		357.94		98.31		180.5
	899.50		840.80		984.10		984.10		421.6

*In each triplet set, the first entry relates to 1962-63, the second entry refers to 1969-70, and the third entry stands as a respective element of 1974-75 input-output coefficient matrix.

Contd....

Table 1

Appendix

Input-Output Coefficient Matrices for 1962-63, 1969-70 and 1974-75.

	26 Construction		27 Miscellaneous Manufactures		28 Coal & Petroleum Products		29 Electricity and Gas
01	0.00203*	03	0.00149	16	0.00543	21	0.01017
	0.00143		0.0014		0.0024		0.0097
	0.00202		0.00134		0.00360		0.02102
02	0.01264	04	0.01269	17	0.00499	22	0.00521
	0.0091		0.0125		0.0066		0.0050
	0.01347		0.01184		0.00172		0.01007
04	0.01952	08	0.00075	20	0.02717	28	0.01790
	0.0137		0.0008		0.0334		0.0216
	0.01814		0.00078		0.01888		0.08218
16	0.00947	09	0.00149	25	0.00037	29	0.25538
	0.0034		0.0015		0.0005		0.2554
	0.01341		0.00143		0.00028		0.25538
17	0.00870	11	0.03591	28	0.12988	32	0.00028
	0.0093		0.0423		0.12988		0.0003
	0.00639		0.02241		0.12988		0.00059
18	0.16883	12	0.04096	29	0.00298	33	0.00168
	0.1266		0.0302		0.0025		0.0019
	0.13222		0.03294		0.00065		0.00330
19	0.16830	13	0.00075	30	0.08113		
	0.1939		0.0010		0.0752		
	0.28947		0.00050		0.03814		
20	0.06415	16	0.10776	31	0.11016		
	0.063?		0.0542		0.1053		
	0.09513		0.15312		0.05229		
21	0.01084	17	0.09893	32	0.00037		
	0.0069		0.1496		0.0003		
	0.01042		0.07301		0.00017		
22	0.00556	20	0.03731	33	0.02121		
	0.0035		0.0523		0.0203		
	0.00499		0.05555		0.00909		
27	0.00278	27	0.07090				
	0.0020		0.07090				
	0.00277		0.07090				
28	0.00380	28	0.02463				
	0.0031		0.0281				
	0.00811		0.05277				
29	0.00891	29	0.02985				
	0.0060		0.0282				
	0.00414		0.01393				
32	0.00039	30	0.02164				
	0 0003		0.0229				
	0.00039		0.02180				
33	0.00124	31	0.07985				
	0.0010		0.0871				
	0.00114		0.08121				
		32	0.00821				
			0.0083				
			0.00811				
		33	0.02313				
			0.0253				
			0.02124				
40	0.48716	40	0.59627	40	0.38370	40	0.29063
	0.4439		0.6173		0.3764		0.2939
	0.60222		0.62290		0.25471		0.37255
100	3054.0	100	134.0	100	268.7	100	357.5
	5413.5		168.5		385.3		424.8
	8316.04		363.5		1561.8		452.6

*In each triplet set, the first entry relates to 1962-63, the second entry re to 1969-70, and the third entry stands as a respective element of 1974-75 ir output coefficient matrix.

Table 7 — Appendix

Input-Output Coefficient Matrices for 1962-63, 1969-70 and 1974-75.

30	Transport	31	Trade	32	Government	33	Services n.e.s.
09	0.00006*	11	0.00025	04	0.00270	11	0.00286
	0.0001		0.0003		0.0026		0.0031
	0.00004		0.00015		0.00255		0.00194
11	0.00427	12	0.00029	10	0.00014	12	0.00326
	0.0048		0.0002		0.0002		0.0022
	0.00264		0.00023		0.00017		0.00285
12	0.00487	29	0.00287	11	0.00322	16	0.00037
	0.0034		0.0025		0.0037		0.0002
	0.00389		0.00132		0.00203		0.00058
16	0.00064	30	0.01310	12	0.00367	17	0.00034
	0.0003		0.0127		0.0027		0.0004
	0.00090		0.01298		0.00299		0.00027
17	0.00058	32	0.00431	16	0.00127	20	0.00010
	0.0008		0.0040		0.0006		0.00010
	0.00043		0.00418		0.00182		0.00016
23	0.05858	33	0.02596	17	0.00116	21	0.00061
	0.1029		0.0260		0.0018		0.0005
	0.05814		0.02344		0.00087		0.00064
24	0.080003			20	0.000945	22	0.00031
	0.0283				0.0013		0.0003
	0.07944				0.00142		0.00030
28	0.19087			21	0.00022	27	0.00173
	0.2058				0.0002		0.0016
	0.40595				0.00022		0.00189
29	0.00011			22	0.00011	29	0.00352
	0.0001				0.00010		0.0030
	0.00005				0.00010		0.00383
32	0.00066			27	0.00162	30	0.01528
	0.0006				0.0016		0.0148
	0.00063				0.00164		0.01677
33	0.00316			28	0.010125	32	0.00795
	0.0033				0.0114		0.0074
	0.00288				0.02196		0.00855
				29	0.01688	33	0.00703
					0.0157		0.0070
					0.00797		0.00703
				30	0.08734		
					0.0910		
					0.08908		
				32	0.05825		
					0.05820		
					0.05825		
				33	0.00284		
					0.0030		
					0.00264		
40	0.34381	40	0.04678	40	0.19048	40	0.04335
	0.3527		0.0457		0.1941		0.0406
	0.55499		0.04230		0.19372		0.04481
100	1806.5	100	2785.3	100	1481.5	100	1962.9
	2401.7		3818.4		1890.8		2694.3
	4936.8		7684.1		3969.7		4889.6

*In each triplet set, the first entry relates to 1962-63, the second entry refers to 1969-70, and the third entry stands as a respective element of 1974-75 input-output coefficient matrix.